What is claimed is:

1. A plasma etching apparatus comprising a chuck for retaining a substrate and hardware that includes oxygen therein such that said oxygen is released when an etching operation is carried out.

2. The plasma etching apparatus as in claim 1, wherein said chuck is substantially circular and said hardware comprises a focus ring that peripherally surrounds said chuck.

3. The plasma etching apparatus as in claim 1, wherein said chuck is substantially circular and said hardware comprises a focus ring that is annular in shape and at least a portion of said focus ring substantially continuously extends below a peripheral portion of said chuck.

4. The plasma etching apparatus as in claim 1, wherein said chuck comprises an electrostatic chuck.

5. The plasma etching apparatus as in claim 1, wherein said hardware comprises a focus ring composed primarily of quartz.

6. The plasma etching apparatus as in claim 1, wherein said hardware comprises a focus ring formed of a ceramic.

7. The plasma etching apparatus as in claim 2, further comprising a further focus ring, said focus ring and said further focus ring forming a focus ring set that peripherally surrounds said chuck.

8. A plasma etching apparatus comprising a chuck for retaining a substrate and a focus ring, at least one of said chuck and said focus ring including oxygen therein such that said oxygen is released when an etching operation is carried out.

9. A plasma etching apparatus comprising an etch chamber including therein a focus ring and a chuck for retaining a substrate, said focus ring maintainable at a temperature no greater than a temperature of said substrate while an etching operation is carried out upon said substrate.

10. The plasma etching apparatus as in claim 9, wherein said chuck comprises an electrostatic chuck and said substrate comprises a semiconductor substrate.

11. The plasma etching apparatus as in claim 9, wherein said focus ring maintains contact with said electrostatic chuck and said electrostatic chuck is cooled during said etching operation.

12. The plasma etching apparatus as in claim 11, wherein said focus ring is disposed peripherally around said substrate and includes a portion that rests on an annular landing section of electrostatic chuck.

13. The plasma etching apparatus as in claim 11, wherein said focus ring includes oxygen therein such that said oxygen is released during an etching process.

14. A method for etching a semiconductor device on a substrate, comprising:

providing an etching tool including therein a chuck for retaining a substrate and an oxygen-impregnated focus ring; and

performing an etch operation such that said oxygen is liberated.

15. The method as in claim 14, wherein said providing further includes providing a semiconductor substrate on said chuck and said etching operation includes a gas including $C_x F_y H_z$.

16. The method as in claim 14, wherein said providing includes providing a substrate on said chuck and further comprising cooling said substrate with a gas that includes oxygen.

17. The method as in claim 16, wherein said gas further include helium and said cooling comprises directing said gas through openings in said chuck.

18. A method for etching a substrate comprising:

providing an etching apparatus including an etching chamber having therein a chuck for retaining a substrate and a focus ring;

etching a film on a substrate disposed on said chuck; and

maintaining said focus ring at a temperature no greater than a temperature of said substrate and maintaining at least a portion of said focus ring in contact with said chuck, during said etching.

19. The method as in claim 18, wherein said maintaining and said etching occur substantially simultaneously.

20. The method as in claim 18, in which said focus ring is formed of quartz and said chuck comprises an electrostatic chuck.

21. A method for etching a substrate comprising:

providing a substrate on a chuck;

etching said substrate ;

generating an oxygen plasma and performing a clean operation while said substrate is on said chuck; and

further generating a further oxygen plasma and performing a further clean operation while said substrate is positioned above said chuck or a further chuck.

22. The method as in claim 21, wherein said providing a substrate comprises providing a semiconductor substrate on a chuck, said semiconductor substrate including

a dielectric layer formed thereon, and said etching comprises etching said dielectric layer.

23. The method as in claim 21, wherein said generating and said further generating are performed in in-situ.

24. The method as in claim 21, wherein said etching includes using $C_xF_yH_z$ as an etching gas.

25. The method as in claim 21, wherein said further generating includes said substrate spaced above said chuck by pins that extend above said chuck.

26. The method as in claim 22, wherein said dielectric layer includes a dielectric constant less than 3.2 and at least one of said first generating and said further generating includes a pressure less than 100 mT.

27. The method as in claim 22, wherein said dielectric layer includes a dielectric constant greater than 3.2 and at least one of said generating and said further generating includes a pressure greater than 50 mT.

28. A method for etching a semiconductor substrate comprising:

providing an etching tool having an etch chamber including a semiconductor substrate disposed on a chuck and substantially peripherally surrounded by a focus ring that includes oxygen incorporated therein;

performing an etching operation such that said oxygen is liberated;

during said performing, maintaining said focus ring at a temperature no greater than a temperature of said semiconductor substrate and at least partially in contact with said chuck;

after said performing, generating an oxygen plasma and cleaning said semiconductor substrate with said oxygen plasma while said semiconductor substrate is disposed on said chuck;

after said performing, generating a further oxygen plasma and further cleaning said semiconductor substrate with said further oxygen plasma while said semiconductor substrate is spaced over said chuck or a further chuck; and

cooling by directing a mixture of helium and oxygen through openings formed in said chuck or said further chuck.